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Title: WOBBLE DEMODULATOR AND WOBBLE DEMODULATION METHOD
Attorney Name: Douglas P. Mueller
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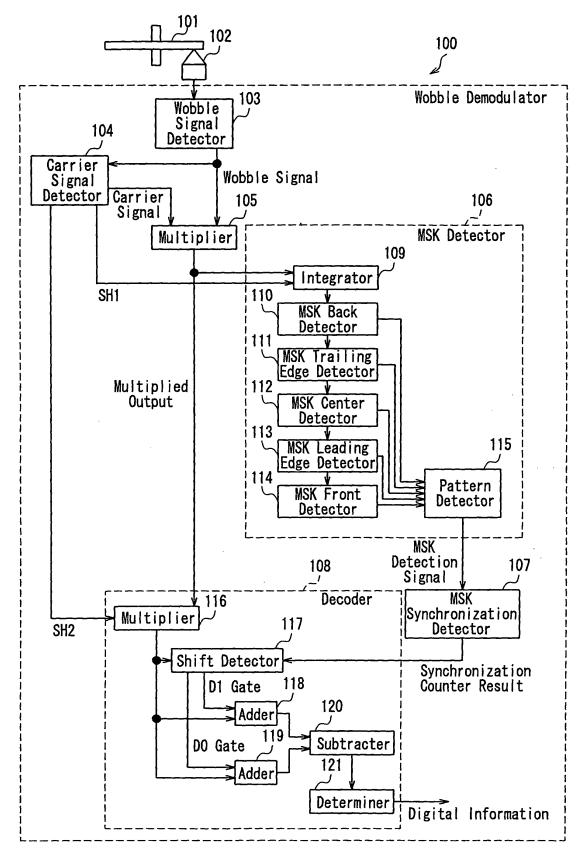


FIG. 1

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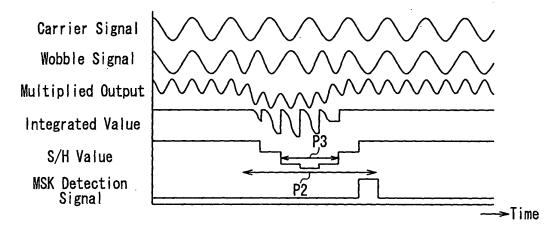


FIG. 2A

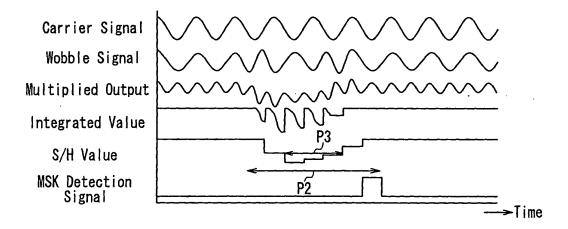


FIG. 2B

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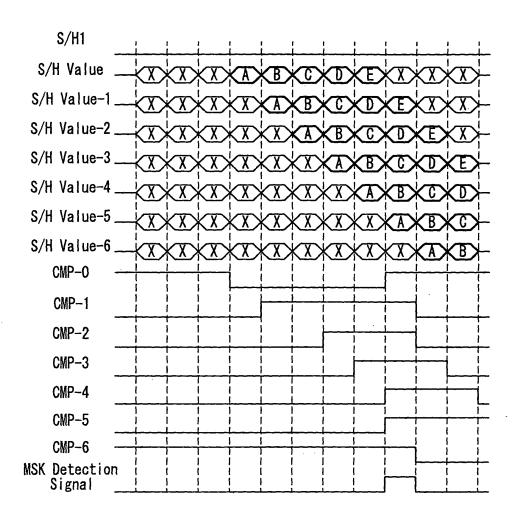


FIG. 3

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FIG. 4A

Synchronization Counter Result Carrier Signal

Wobble Signal Data "1"

Wobble Signal Data "0"

Multiplied Value Data "1"

Integrated Value Data "1"

S/H Data "1"

Multiplied Value Data "0"

Integrated Value Data "0"

S/H Data "0"

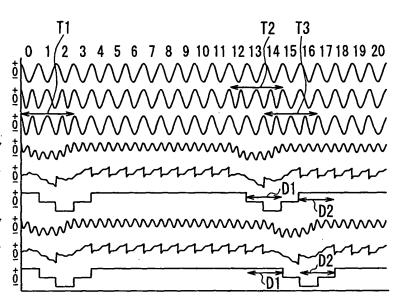


FIG. 4B

Carrier Signal
Wobble Signal Data "1"
Wobble Signal Data "0"
Multiplied Value Data "1"
Integrated Value Data "1"
S/H Data "1"

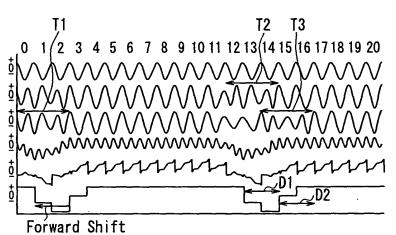
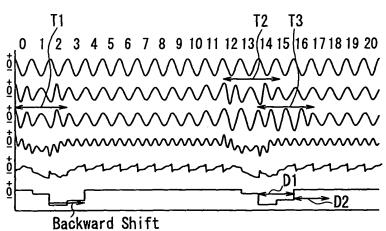


FIG. 4C

Carrier Signal
Wobble Signal Data "1"
Wobble Signal Data "0"
Multiplied Value Data "1"
Integrated Value Data "1"
S/H Data "1"



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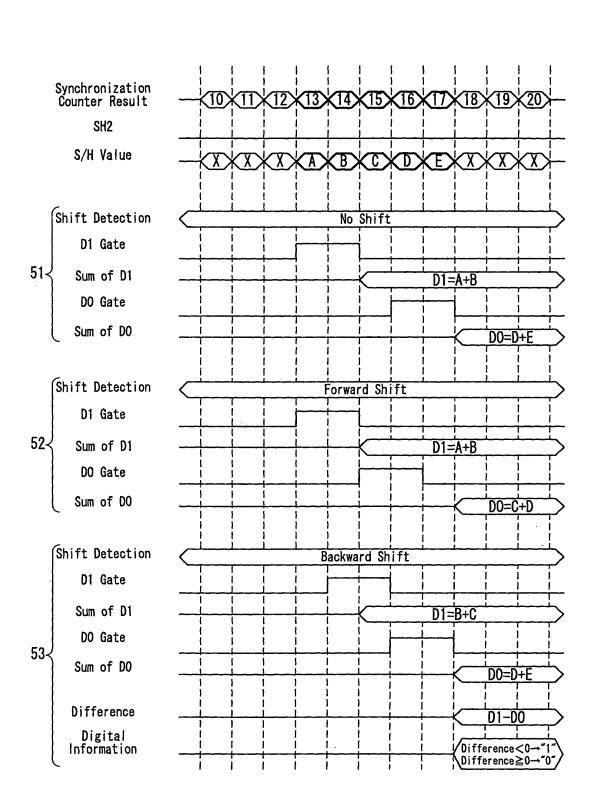


FIG. 5

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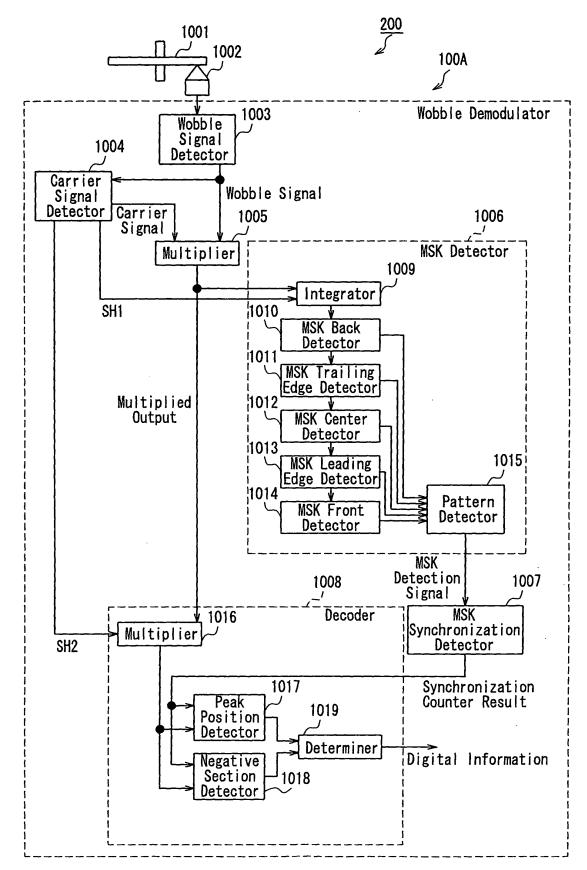
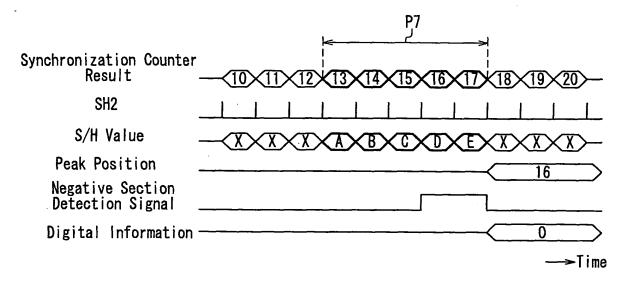


FIG. 6

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F1G. 7

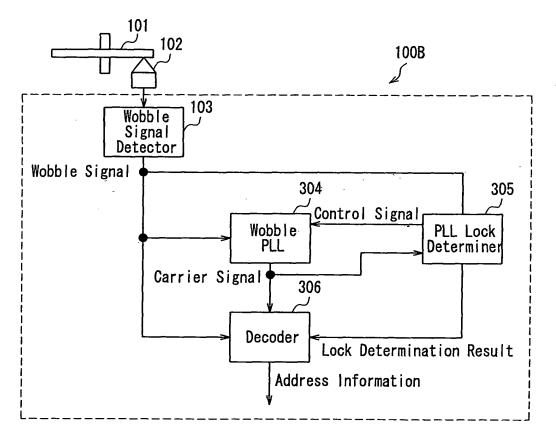


FIG. 8

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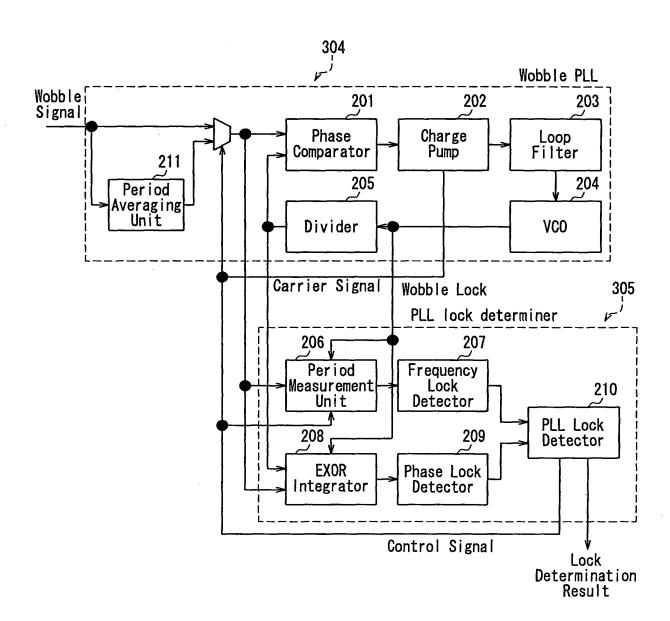


FIG. 9

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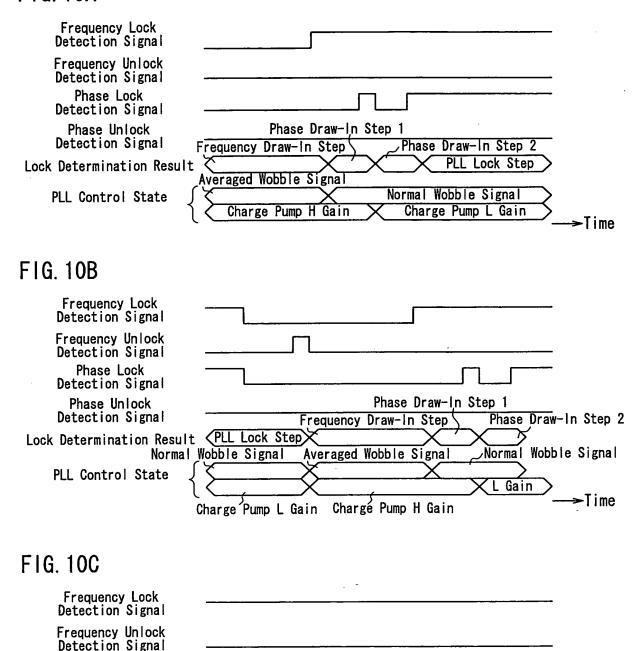
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FIG. 10A

Phase Lock **Detection Signal** Phase Unlock Detection Signal

Lock Determination Result

PLL Control State



Phase Draw-In Step 1

H Gain

Normal Wobble Signal

PLL Lock Step

Charge Pump L Gain

Phase Draw-In Step 2

>Time

PLL Lock Step

L Gain

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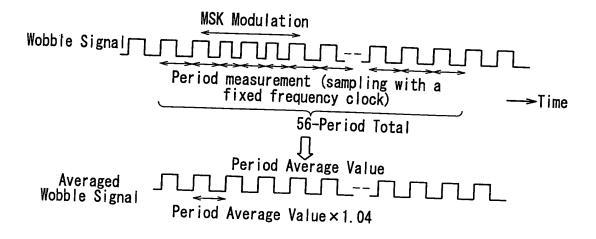


FIG. 11A

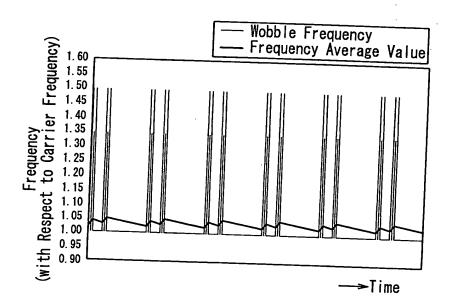


FIG. 11B

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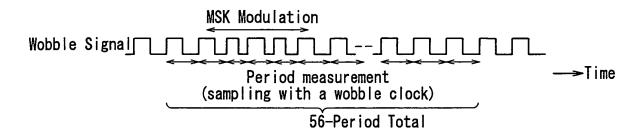


FIG. 12A

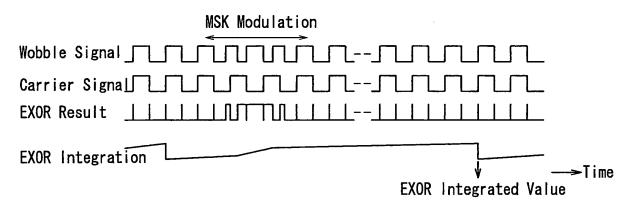


FIG. 12B

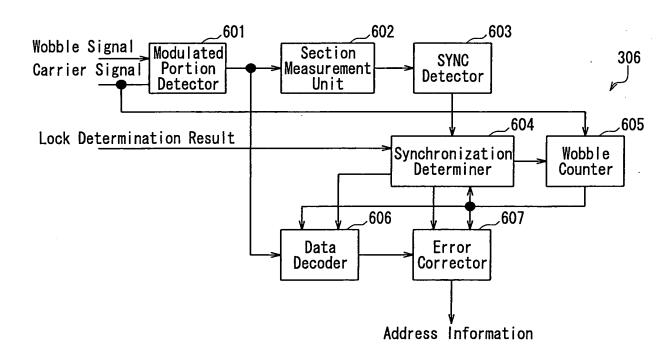


FIG. 13

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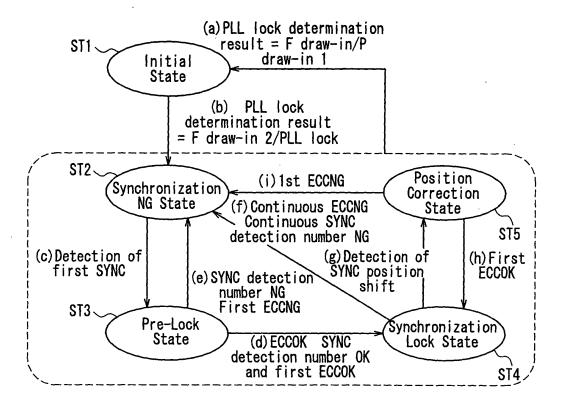


FIG. 14

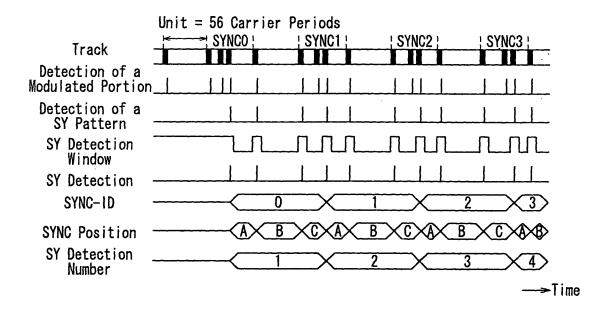


FIG. 15

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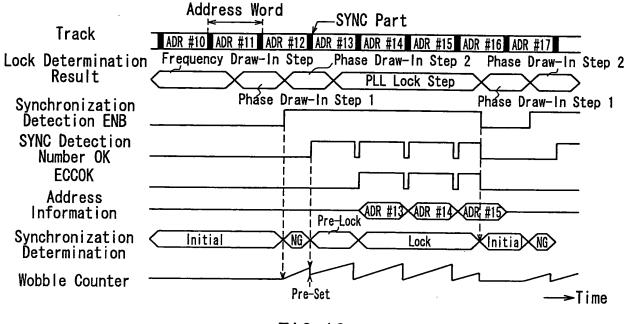


FIG. 16

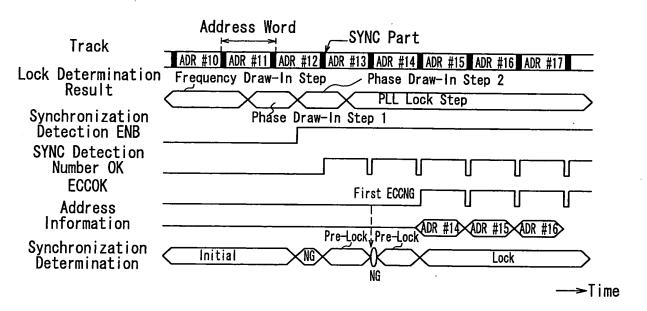


FIG. 17

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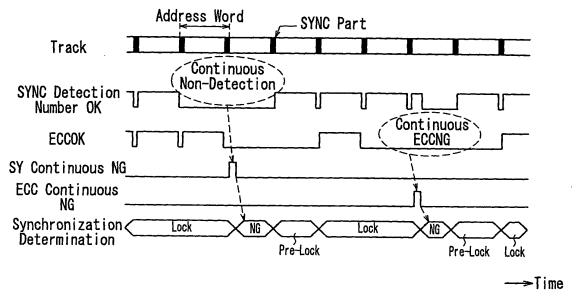


FIG. 18

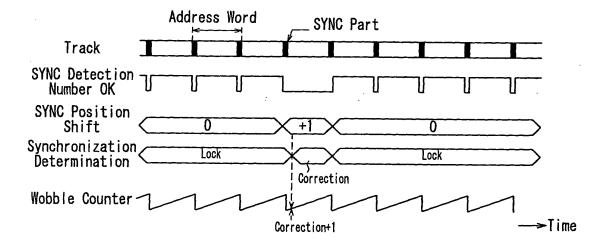


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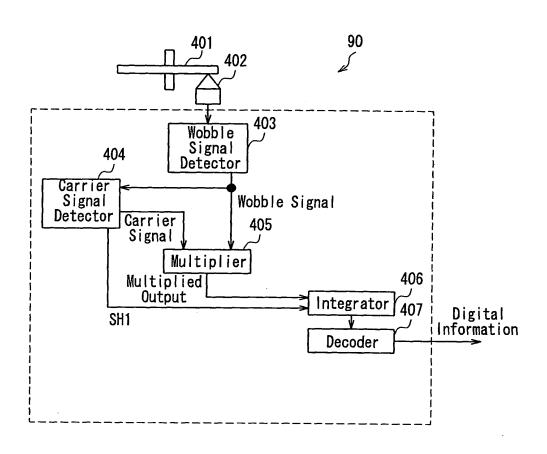
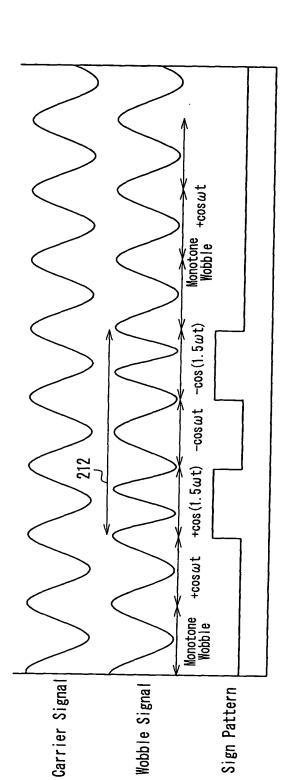


FIG. 20 PRIOR ART

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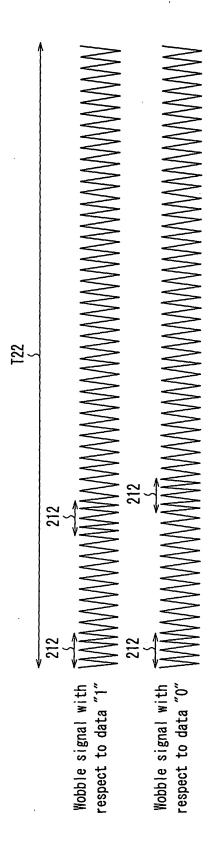
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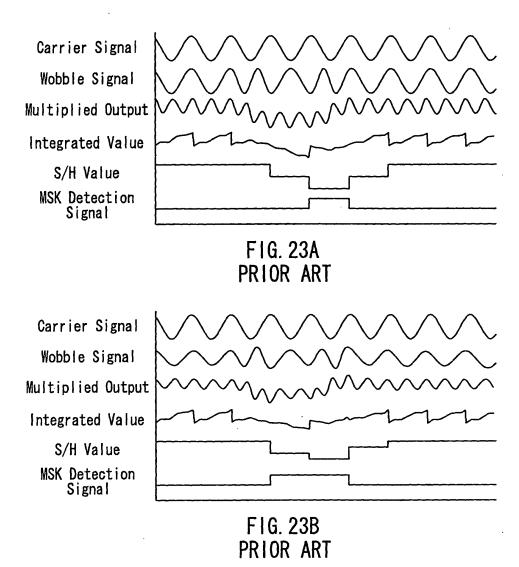
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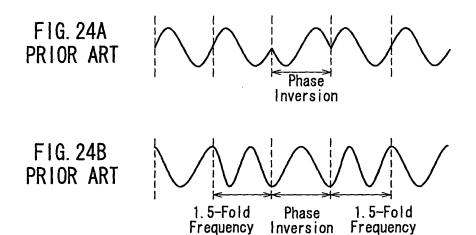


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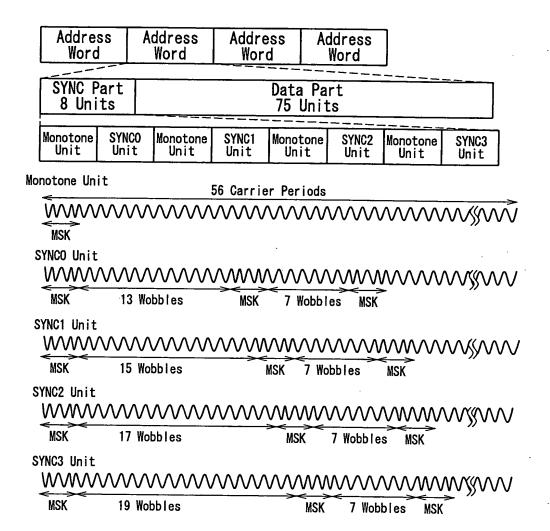
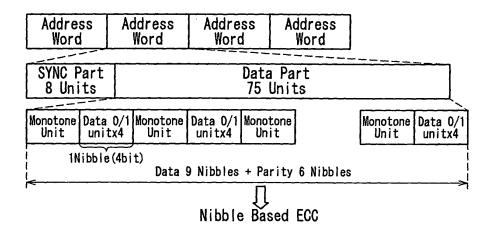


FIG. 25 PRIOR ART

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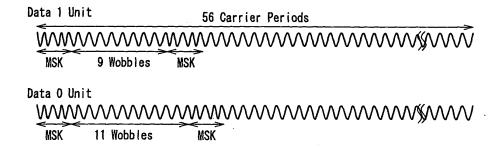


FIG. 26 PRIOR ART

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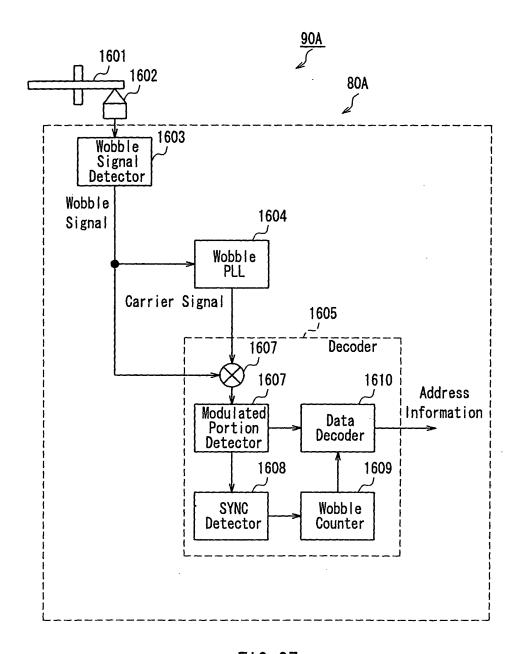


FIG. 27 PRIOR ART

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Wobble Signal

Carrier Signa

Output of a Multiplied Signal and LPF

MSK Detection Signal

FIG. 28A PRIOR ART

Wobble Signal

Carrier Signal

Output of a Multiplied Signal and LPF

MSK Detection Signal

FIG. 28B PRIOR ART